Attachment B

IRA Work Plan: Midland Soils

Midland Soils Interim Response Activity Work Plan

Prepared for

The Dow Chemical Company

47 Building
Midland, Michigan

February 2004

CH2MHILL

Contents

Acronyms and Abbreviations

ATSDR	Agency for Toxic Substance and Disease Registry
Dow	The Dow Chemical Company
Facility	Dow Michigan Operations Midland Facility
IRA	Interim Response Activity
MDCH	Michigan Department of Community Health
MDEQ	Michigan Department of Environmental Quality
PCOI	potential constituents of interest
ppt	parts per trillion
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Project Plan
RI	Remedial Investigation
SAP	sampling and analysis plan
SOP	Standard Operating Procedure
TEQ	toxic equivalent
TM	Technical Memorandum

Midland Soils Interim Response Activity Work Plan

1. Introduction

This document describes the scope and process The Dow Chemical Company (Dow) will use to perform an Interim Response Activity (IRA) for the Midland Soils Offsite Area. The IRA is being done pursuant to Condition XI.B.3.(a) of the Hazardous Waste Facility Operating License issued to Dow on June 12, 2003, by the Michigan Department of Environmental Quality (MDEQ). Information presented herein includes:

- The overall objectives of the IRA
- A description of the IRA area
- A summary of the IRA tasks
- The overall IRA schedule
- A list of contacts
- Detailed work plans for each IRA task (included as appendices)

The area for this IRA includes areas within the City of Midland identified by MDEQ as areas of concern that require the collection of additional data. These areas are identified on Figure 1.

2. Overall IRA Objectives

In general, IRAs are short-term actions that are taken to control ongoing risk while site characterization is underway or before a final remedy is selected. More specifically, this IRA will:

- Allow further evaluation of potentially impacted properties identified by MDEQ in areas that are proximal to the Dow Michigan Operations Midland Facility (Facility).
- Determine, based on sampling results, whether interim mitigation actions are necessary and identify an appropriate range of implementable measures.
- Provide information necessary for development and planning of future soil sampling activities to be conducted under the Remedial Investigation (RI) Work Plan, if necessary.

3. Interim Action Decision Matrix

Once areas identified as part of this IRA are evaluated to determine the concentrations of dioxin and furans and in surface soils (0 to 3-inches), Dow will determine whether additional interim actions area necessary. Dow is proposing the following Interim Action Levels be used to establish Exposure Categories for potential mitigation measures and in the prioritization of interim actions being conducted to reduce exposure potential during the RI and before final remedy evaluation is completed (the numbers refer to concentrations of dioxin in soil, expressed as TEQ [toxic equivalent]):

- **At or below 90 parts per trillion (ppt) – No action is required.** This is consistent with the requirements of Part 201, which indicate that no corrective action is necessary if concentrations are found to be below Generic Residential Cleanup Criteria.
- **Between 91 and 1,000 ppt – Provide information to reduce potential exposures.** These actions will provide property owners with information that allow them to take appropriate actions to further reduce their potential for exposure while RI evaluations are being completed.
- **Above 1,000 ppt – Implement actions to reduce potential exposure.** In 2001, the Michigan Department of Community Health (MDCH) and the Agency for Toxic Substance Registry (ATSDR) performed a public health assessment in Midland to evaluate concerns that had been expressed related to dioxins and furans in soils. In that study, titled "Petitioned Health Consultation: Dioxin Contamination in Soil in Midland, Michigan", ATSDR stated that *"…The action level of 1,000 ppt TEQ is a concentration of dioxin in soil at which various actions may be considered to prevent or limit exposure."* ATSDR cited potential actions such as surveillance, research, health studies, community education, and exposure investigations. This level is the same as the final dioxin cleanup criteria that have been approved in several in several states for residential properties.

The Interim Action Decision Matrix, shown in Table 1 describes the Exposure Categories developed for interim use, as well as a range of corresponding mitigation options. Dow will use the information obtained through the Activity Surveys and sampling data to determine what category is appropriate for a given property, and offer the corresponding range of mitigation options to the property owner.

TABLE 1
Interim Action Decision Matrix
The Dow Chemical Company

Exposure Category	Exposure Category Description	Mitigation Options
A	Residential Use, with high potential for routine or prolonged direct contact with surface soil, dioxin and furan concentrations in surface soil (0 to 3 inches) above 1,000 ppt TEQ. Situations considered to have a high potential for direct contact with soils include areas that are frequently used for gardening or as active play areas, large areas of exposed soil with no vegetation in close proximity to the residence, or other areas where the use involves routine disturbance of soil.	• Cover (sod, soil, raised garden bed, raised area, mulch) • Identify affected areas • Augment existing cover • House cleaning • Provide additional information and educational materials as appropriate
B	Residential Use, with lower potential for routine or prolonged direct contact with soil, dioxin concentrations in surface soil (0 to 3 inches) above 1000 ppt TEQ. Situations considered to have lower potential for direct contact with surface soil would include areas with occasional use, areas covered by wood decking or with significant vegetative cover.	• Identify affected areas • Provide additional information and educational materials as appropriate
C	Residential Use, with minimal potential for direct contact with surface soils, dioxin and furan	• Identify affected areas • Provide additional information and educational materials as

TABLE 1
Interim Action Decision Matrix
The Dow Chemical Company

Exposure Category	Exposure Category Description	Mitigation Options
	concentrations in surface soil (0 to 3 inches) less than 1,000 ppt TEQ.	appropriate
D	Agricultural Use, that is actively farmed	• Identify affected areas • Provide additional information and educational materials as appropriate
E	Recreational Use, (if not addressed in a separate IRA).	• Provide additional information and educational materials as appropriate
F	Other Uses not covered in Items A-E, which exceeds applicable generic criteria.	• Provide additional information and educational materials as appropriate

The mitigation options cited in Table 1 above are currently defined as follows:

- House cleaning would be performed for residential properties where surface soil were found to have dioxins and furans at concentrations greater than 1,000 ppt TEQ in areas immediately adjacent to the house. Cleaning would focus on the interior of the house and would include cleaning of surfaces and replacing furnace filters. Interior surfaces will be sampled before and after cleaning to document conditions.
- Mitigation activities involving a cover could include placing clean topsoil and or sod, and relocating or raising garden beds.
- Identification of affected areas to identify the approximate area where sampling results indicate that dioxin and furans may be present. Identification may be made using flags, stakes or other practical methods, based on Dow's discussions with the individual owners/occupants.

4. IRA Task Summary

The following sections describe the individual tasks that will be completed as part of this IRA. Task work plans, in sufficient detail to be immediately implemented, are provided in Attachments A and B.

4.1 Corning Lane

The primary objective of this IRA is to collect additional site characterization data to evaluate concentrations of dioxins and furans in soils in an area closest to the northern and eastern boundaries of the Facility. Four areas have been identified by MDEQ and this task includes one of the four areas. The remaining areas are covered in the next task entitled "Areas Proximal to Facility".

MDEQ has collected samples along the eastern boundary of the Facility site along Saginaw Road. Of five soil samples analyzed for dioxins and furans near the intersections of Saginaw

Road and Corning Lane, the minimum concentration reported was 73 ppt TEQ and the maximum was 923 ppt TEQ. Based on these results and consideration of the prevailing wind direction, MDEQ has indicated that collecting samples representative of residential properties along Corning Lane is a high priority. The IRA work plan for Corning Lane is designed to address these concerns by collecting data on soil concentrations and conducting an exposure assessment that will include soil sampling in this area. The work plan for this IRA is included as Attachment A.

4.2 Areas Proximal to Facility

The primary objective of this IRA is to collect additional site characterization data to evaluate concentrations of dioxins and furans in soils in areas near to the northern and eastern boundaries of the Facility. Another important objective for soil sampling will be to determine whether dioxins and furans are present in surface soils at concentrations greater than the IRA Action Levels described in Section 3. Four areas have been identified by MDEQ and this IRA includes three of the four areas. The remaining area is covered by the IRA entitled "Work Plan for Corning Lane."

MDEQ has collected soil samples at various locations in the City of Midland some of which are in or adjacent to the 3 areas of concern identified under this IRA. The areas identified under this IRA include the following:

- North of Facility: This area consists of mixed residential and commercial/industrial land use bounded by Lyon Street on the north and west, Tibbs Street to the east, and an abandoned railroad to the south.
- East of Facility: This area consists predominantly of residential land use bounded by Bay City Road to the north, Bierlein Services to the west, Mark Putnam Road to the south, and Sam Street to the east.
- Virginia Park Area: This area consists predominately of residential land use bounded by Eastlawn Drive to the north, Washington Street and Saginaw Road to the west, Patrick Road to the south, and Swede Road to the east.

Soil concentrations of dioxins and furans measured by MDEQ near these areas are highly variable, but generally exceed 90 ppt TEQ. Based on these results and in consideration of the prevailing wind direction, MDEQ has indicated that collecting samples in this area is a high priority. This IRA work plan is designed to address these concerns in an expedited manner by collecting representative soil samples and analyzing them for dioxins and furans. The IRA Work Plan for Areas Proximal to the Facility is contained in Attachment B.

4.3 Soil Sampling

4.3.1 Sampling and Analytical Plans

Site-specific sampling and analytical plans (SAPs) will be prepared for Corning Lane and the Areas Proximal to Facility noted in the previous sections once access agreements have been secured. The SAPs will provide the site-specific details associated with field sampling efforts, and will include:

- Sampling event objective
- Data Quality Objective(s)
- Description of sampling effort
- Sampling Locations (figure with locations shown on a GIS aerial photo base map)

- Sample Details (a matrix indicating media, sampling interval, and analytes)
- Analyte lists which may include the potential constituents of interest (PCOIs) identified to date as part of the development of the Current Conditions Report

The SAP will be provided to MDEQ for review and approval prior to beginning sampling activities.

Because IRA data will be used for any future RI work, IRA plans will be developed on the same basis as subsequent RI sampling plans to ensure that data is consistent, of the same quality, and can all be considered as part of the RI evaluation of the nature and extent of contamination. Therefore, an additional objective of the SAP will be to obtain information that can be used as part of the process for the establishment of site-specific cleanup criteria and in the development of the scope of the RI. This could include analysis for other PCOIs, physical properties of soils, better delineation of properties, evidence of past deposition, and obtaining other information that can be used to determine the nature and extent of contamination. These will be described in the site-specific sampling and analytical plan.

Core Program Plans and Standard Operating Procedures (SOPs) are currently being developed by Dow and will be used for all sampling done as part of the Offsite Corrective Action Work. Core Program Plans such as the Health and Safety Plan and the Quality Assurance Project Plan (QAPP) will be incorporated into the IRA plans by reference, as will applicable SOPs to describe specific methodologies and protocols for sampling and analytical work. These documents will be provided to MDEQ for review prior to submittal of the IRA sampling and analytical plans.

4.3.2 Review and Scheduling of Field Sampling and Analytical Work

While MDEQ is reviewing the SAP, Dow will be assembling field crews, obtaining utility clearances and any permits associated with the proposed field work. Dow will initiate field sampling activities upon MDEQ approval of the SAP, and will provide both MDEQ and the property owner 5 working days prior notice of the sampling date.

4.3.3 Data Evaluation and Reporting

Once work sampling and analysis have been completed, the following tasks will be performed:

- Perform data validation to ensure appropriate quality assurance and quality control (QA/QC) and to verify that DQOs were met.
- Evaluate data according to the Interim Action Decision Process outlined in Section 3 below and identify the corresponding range of Mitigation Options as outlined in The Interim Action Decision Matrix in Table 1.
- Update the Conceptual Site Model to refine the understanding of physical site conditions, nature and extent of contamination, potential exposure pathways, fate and transport information and potential receptors.
- Prepare a summary report, in the form of a Technical Memorandum (TM) to document the results. Copies of these TMs will be provided to the property owners and MDEQ. This report will include, at a minimum, the following information:
  - Documentation of any field work conducted
  - Quality assured analytical results

- Maps showing the locations where samples were collected
- Copies of questionnaires, where conducted
- Results of comparison of analytical data, questionnaire, and other appropriate data to use the Interim Decision Matrix

The purpose of this report will be to provide data to the MDEQ documenting the results of the IRA. The report is not intended to provide a comprehensive evaluation of site characterization data, a comprehensive evaluation of all relevant data will be part of the Remedial Investigation.

5. Overall IRA Schedule

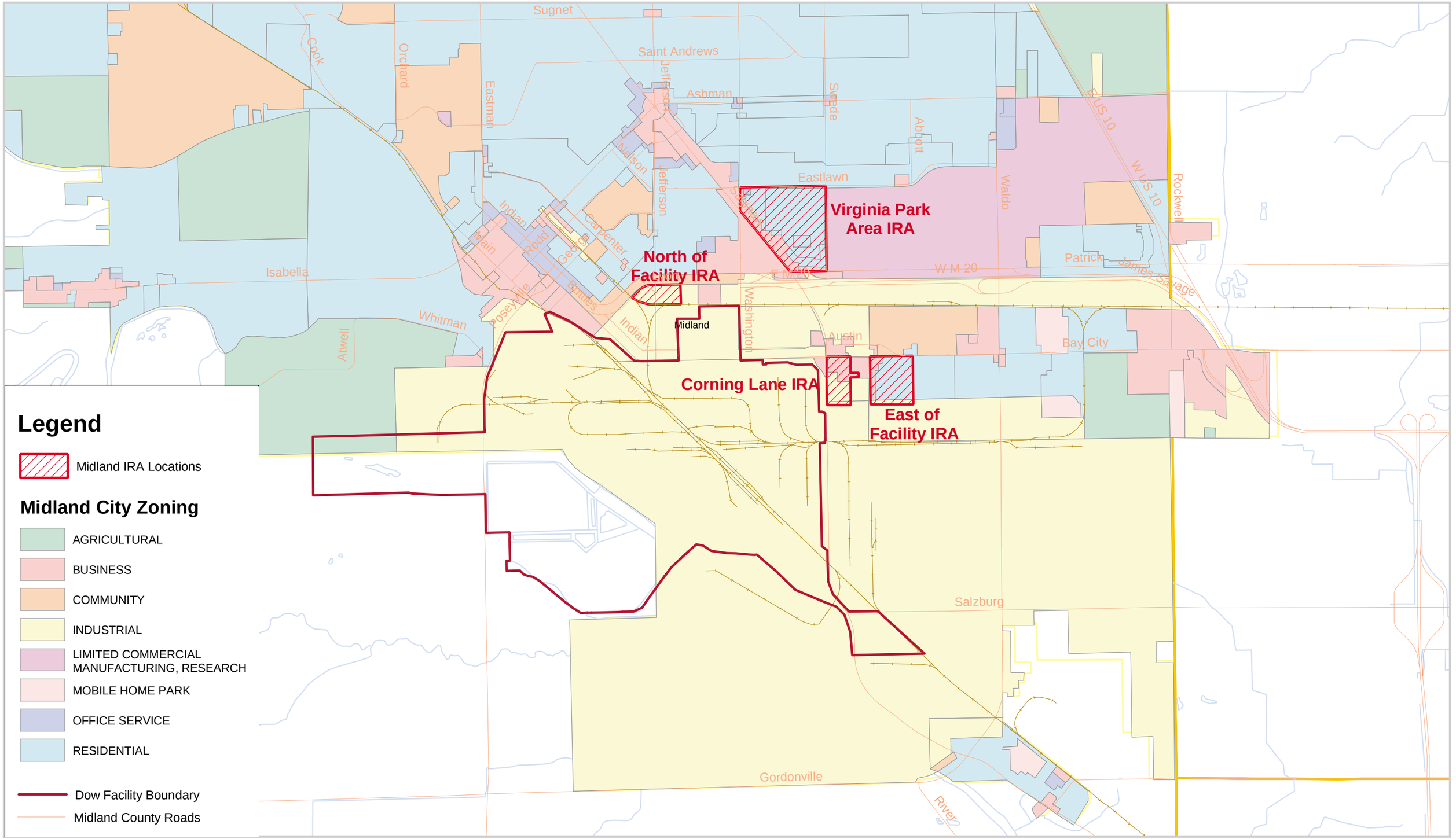
The IRA will be completed on the schedule shown in the Scope of Work.

6. Contacts

The following contacts are identified for this IRA.

Dow
Ben Baker
Senior Environmental Project Leader
47 Building
Midland, MI 48667
989-636-0787

CH2M HILL
Gary Dyke
Project Manager
1111 Washington Street
Midland MI 48640



Legend

Midland IRA Locations

Midland City Zoning

- AGRICULTURAL
- BUSINESS
- COMMUNITY
- INDUSTRIAL
- LIMITED COMMERCIAL MANUFACTURING, RESEARCH
- MOBILE HOME PARK
- OFFICE SERVICE
- RESIDENTIAL

Dow Facility Boundary

Midland County Roads

N W E S

0 0.25 0.5 1 Miles

Source Information:
Base mapping from State of Michigan Center for Geographic Information, Geographic Data Library.

Figure 1
Site Location
Midland Soils IRAs
Dow Midland Offsite Corrective Action Program

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File Path: CGREER C:\GIS\MapDocs\Project IRAs\Dow-IRAs CityofMidland Fig1.mxd, Date: 02 16, 2004 11:45 PM

Appendix A
Work Plan for Corning Lane

Midland Interim Response Activity

Work Plan for Corning Lane

Prepared for

The Dow Chemical Company

47 Building
Midland, Michigan 48667

February 2004

CH2MHILL
CH2M HILL Team

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Work Plan for Corning Lane

1. Objectives

This document is part of the scope and process The Dow Chemical Company (Dow) will use to perform an Interim Response Activity (IRA) for the Midland Soils Offsite Area. The IRA is being done pursuant to Condition XI.B.3.(a) of the Hazardous Waste Facility Operating License issued to Dow on June 12, 2003, by the Michigan Department of Environmental Quality (MDEQ).

The Interim Response Activity IRA is being conducted to evaluate and recommend actions, if necessary, to reduce the potential for exposure to dioxins and furans in soil and/or dust at potentially affected properties in the Corning Lane area in Midland, Michigan as depicted in Figure A-1. At this time adequate sampling has not been conducted to evaluate the presence or the absence of potential exposure pathways in the area along Corning Lane. Therefore, the first phase of this IRA will be to collect sufficient data to evaluate potential concentrations and exposure pathways.

2. Description of Interim Response Activities

The MDEQ has indicated that collecting samples representative of residential properties in this area is a high priority. This IRA work plan is designed to address these concerns in an expedited manner.

The overall approach to this IRA involves a two-step process. First, soil concentrations and exposure pathways will be evaluated at residential properties along Corning Lane. Second, concentrations of dioxins and furans in surface soils and exposure pathways will be evaluated to determine if additional interim response activities are necessary.

2.1 Evaluation of and Soil Concentrations and Potential Exposure Pathways

Soil concentrations will be evaluated by collecting surface soil samples in the area of interest and evaluating potential human exposures by conducting an Activity Survey.

2.1.1 Objectives for Soil Sample Collection and Activity Survey

The primary objective of soil sampling is to obtain data representative of concentrations of dioxins and furans in surface soils resulting from the historic deposition of chemicals emitted from Dow's Michigan Operations Midland Plant (Facility) in the Corning Lane Area. Another important objective for soil sampling will be to determine whether dioxin and furans are present in surface soils at concentrations greater than the Interim Action Levels. In addition to these primary objectives, the following secondary objectives will also be considered:

- Collect data to necessary for developing site-specific cleanup criteria for soils in Midland.
- Collect information regarding the presence of concentrations of constituents of potential concern (other than dioxins and furans) in surface soils.

- Collect data on the variability of concentrations in soil that can be used to develop the sampling design for the remedial investigation.
- Provide a data set on constituents detected in soil in the areas of interest that can be used for comparison with concentrations in soil in background areas. This comparison will be used to better differentiate those chemicals that are facility-related, from chemicals that are part of the natural or anthropogenic background. Identification of background sampling locations is not proposed at this time, but will be part of the upcoming Remedial Investigation.

The primary objective of the Activity Survey will be to develop information about the occupants of the property (such as age, frequency of use, etc.), how they use the property (gardening, recreation, outdoor eating, etc) and the location of the various activities. A sample Activity Survey is included as Attachment 1.

A draft Access Agreement will be presented to the property owners requesting permission for Dow representatives to enter the property to observe site conditions and perform sampling. In the cover letter, Dow will request that the property owner and/or occupants contact Dow to confirm receipt of the materials and indicate their willingness to participate in the IRA. To the extent that Dow is able to obtain telephone numbers for individual property owners, they will also attempt to follow the mailing with a telephone call. Dow will copy MDEQ on these initial mailings, so the Agency has a record of contact. A sample Access Agreement is included as Attachment 2.

Sampling locations will be proposed in a Sampling and Analytical Plan (SAP) and submitted to MDEQ for review and approval. The proposed sample locations will be based upon evaluation of the Activity Survey and the site visit and will include locations that are likely to present the highest potential for human exposure. All samples will be analyzed for dioxins and furans, if appropriate, additional samples may be analyzed for the secondary objectives noted in the preceding paragraphs.

2.1.2 Contacting Property Owners

Cooperation of the property owners and residents will be required to implement the interim response activities. The process for obtaining cooperation will involve the following steps:

- Distribution of notification materials to each property owner seven to 14 days prior to conducting a visit. The notification materials will consist of an introductory letter from Dow, a tentative schedule and approximate time and date when the property owner may expect a phone call to discuss access and solicit their cooperation with the proposed assessment.
- After the notification package has been mailed to the homes, property owners will be contacted by telephone to schedule an initial visit.
- During the initial visit, field staff will attempt to obtain a signed access agreement from the property owner and, if possible, obtain a completed Activity Survey. During the initial site visit, the field staff will evaluate potential areas for sampling, weather permitting. A follow-up visit may be needed, if weather conditions do not allow for adequate visual evaluation of property.

After the Activity Surveys have been completed at each of the properties where access has been obtained, Dow will prepare a Sampling and Analytical Plan and submit it to MDEQ for

review and approval. Dow may elect to propose grouping some properties together rather than collecting samples from each property where access has been obtained.

The following general process will followed for properties approved for sampling in the SAP:

- Dow will provide the property owners' with a letter that summarizes notifies them that their property will be sampled in accordance with the SAP.
- Dow will provide a proposed sampling schedule and will notify the property owner and MDEQ seven to 14 days of the actual sampling event.

2.2 Potential Interim Mitigation Activities

Based on the Activity Survey results and subsequent soil sampling and analysis, an assessment will be made to determine if further response activities to mitigate completed exposure pathways are appropriate at each property. Based on the data and use information obtained, Dow will offer potential interim response actions as set forth in the Interim Action Decision Matrix shown in . This matrix provides a description of the proposed Exposure Categories and a range of Mitigation Options. Dow will use the information obtained through Activity Surveys and analytical data to determine what category is appropriate for a given property, and offer the corresponding range of mitigation options to the property owner.

TABLE 1
Interim Action Decision Matrix
The Dow Chemical Company

Exposure Category	Exposure Category Description	Mitigation Options
A	Residential, frequent use, high potential for routine or prolonged direct contact with surface (0 to three inches deep) soils, dioxin and furan concentrations in surface soil above 1,000 ppt TEQ. Situations considered to have a high potential for direct contact with soils would include gardening, active play areas, large areas of exposed soil with no vegetation, or other activities that involve routine disturbance of soils.	• House cleaning (ducts, carpets, furnace filters) • Cover (sod, soil, raised garden bed, raised area, mulch) • Identify affected areas • Augment existing cover
B	Residential, frequent use, lower potential for routine or prolonged direct contact with soils, dioxin and furan concentrations in surface soil above 1,000 ppt TEQ. Situations considered to have lower potential for direct contact with surface (0 to three inches deep) soils would include activities on wood decking or in areas with significant vegetative cover.	• House cleaning (ducts, carpets, furnace filters) • Identify potentially contaminated areas •
C	Residential, occasional use, minimal potential for direct contact with surface (0 to six inches deep) soils, dioxin concentrations in surface soil above 90 ppt TEQ.	• Identify potentially contaminated areas
D	Industrial /Commercial II, Commercial III, & Commercial IV, concentrations of dioxins and furans above 740, 920, and 820 ppt TEQ, respectively	• Provide additional information and educational materials
All		• Provide additional information and educational materials as appropriate

TABLE 1
Interim Action Decision Matrix
The Dow Chemical Company

Exposure Category	Exposure Category Description	Mitigation Options

The following general steps will be followed upon completing the evaluation of the Interim Action Decision Matrix.

- After receipt of all analytical data, residents will be contacted to schedule a meeting to discuss sampling results and, if appropriate, mitigation activities related to the results.
- If mitigation is appropriate, Dow and the property owner will review the available options and the property owner will determine which measures, if any, are to be implemented.
- If required, a schedule for the implementation of any mitigation activities will be agreed upon between the property owner and Dow.

2.3 Summary of Sampling and Analytical Plan

A site-specific SAP will be prepared once access agreements have been secured. The SAP will provide the site-specific details associated with field sampling efforts, and will include:

- Sampling event objective
- Data Quality Objective(s)
- Description of sampling effort
- Sampling locations (figure with locations shown on a GIS aerial photo base map)
- Sample Details (a matrix indicating media, sampling interval, and analytes)

Analyte lists which may include the potential contaminants of interest identified to date as part of the development of the Current Conditions Report

The SAP will be provided to MDEQ for review and approval prior to beginning sampling activities.

2.3.1 Sample Locations

Approximately 10 sample locations will be selected from the Corning Lane Area, depending upon the availability of sampling sites. Actual locations proposed for sampling will be dependent upon Dow's ability to obtain access from property owners. The priority is to collect soil samples on residential properties.

Upon approval of this IRA work plan, Dow will meet with MDEQ to discuss potential sampling locations and will formally request access for the purpose of collecting soil samples from the property owners. In the event that property owners deny access, Dow will meet with MDEQ to discuss alternative sampling locations.

2.3.2 Target Analyte List

The target analyte list proposed for this sampling event will consist of the following categories of analytes:

- Dioxins and furans (analytical method SW846 8290)

- Volatile organic compounds (VOCs; analytical method SW846 5035/8260B)
- Semivolatile organic compounds (SVOCs; analytical method SW846 8270C)
- Metals (analytical methods SW846 6010B, 7000 series methods ,9010B/9012A)

Herbicides and pesticides are not proposed for analysis. It is unlikely that these constituents would become deposited onto the soil from the Facility from airborne deposition. Also, uses of these chemicals for residential and industrial pest control, and other anthropogenic background sources, could produce concentrations of these chemicals in soil that are unrelated to deposition from facility operations.

The full analyte list and laboratory analytical procedure for each of class of compounds listed above is contained in the Quality Assurance Project Plan (QAPP). The QAPP will be submitted to MDEQ for approval as a separate document. In general, the analyte lists are derived from Appendix IX of 40 CFR Part 264 and MDEQ target analyte lists. Analytical methods and detection limits will conform to USEPA SW846 and MDEQ Operational Memorandum #6.

2.3.3 Soil Sampling Procedures

Soil sampling procedures will be accordance with the protocols contained the in the QAPP and associated Standard Operating Procedures (SOPs).

2.3.4 Reporting

Dow will prepare a brief technical memorandum documenting the results of the soil sampling, completed Activity Surveys, and any mitigation measures completed.

3. Access Needs and Agreements

Access agreements from individual off site property owners are required to implement this IRA. Consistent with the Facility Operating License and Part 201 requirements, Dow will utilize its best efforts to obtain access to properties of interest. However, Dow does not have the ability to compel property owners to allow access.

A copy of a sample Access Agreement is included as Attachment 2.

4. Schedule

The general schedule for implementation of s work plan is as follows:

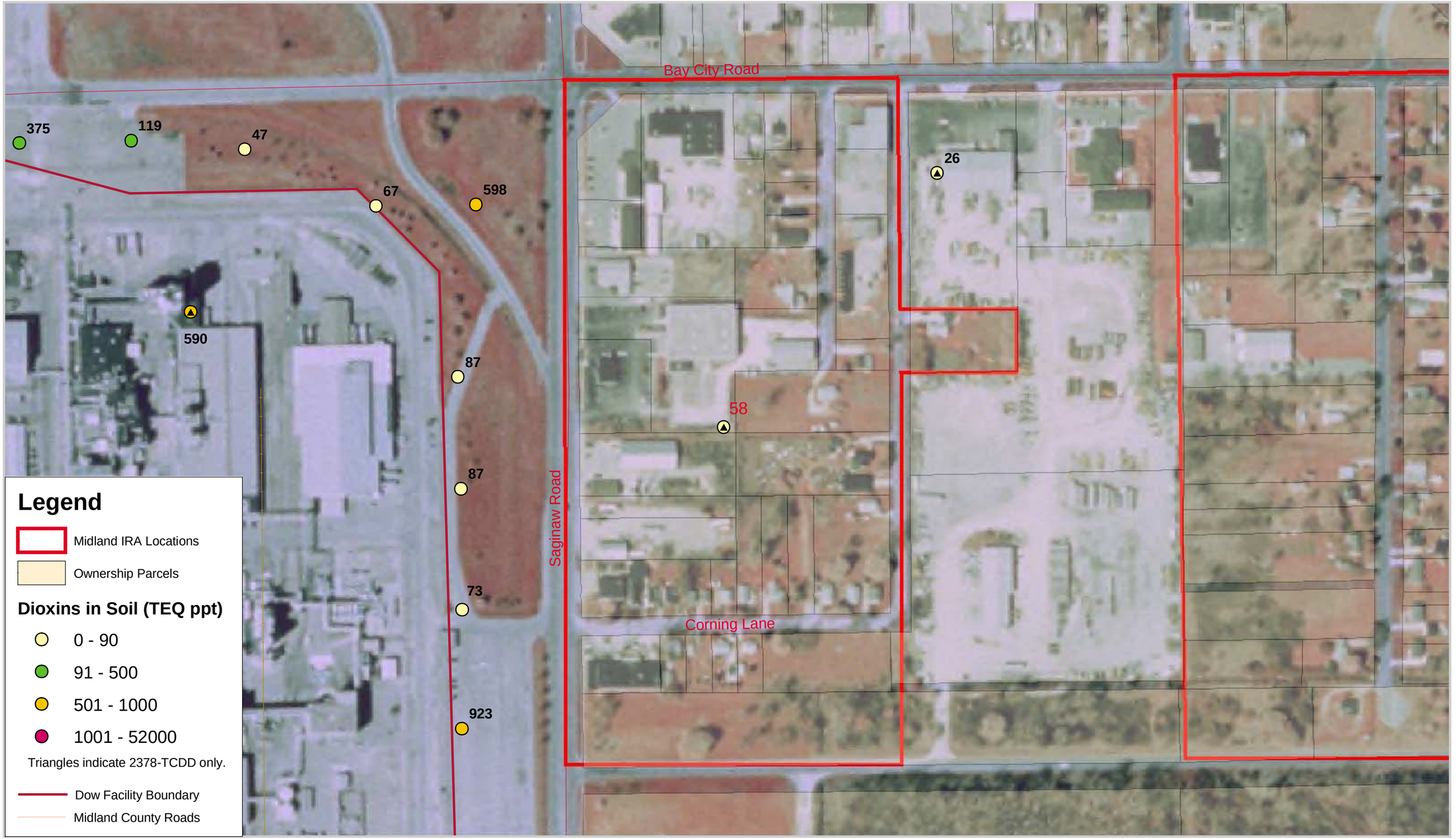
- Within 2 weeks of approval of this work plan: Contact property owners and request a meeting for a site visit, providing access agreement and Activity Survey.

Dow will work to complete the remaining work in an expedited manner and will provide MDEQ with a bi-monthly update on progress of the IRA. Dow cannot control the schedule for the many of the necessary steps; therefore, the following steps are generally outlined to show the process for implementation of this IRA:

- Conduct site visits, obtain executed access agreements, and obtain completed Activity Surveys.

- Identify proposed sample locations, prepare SAP, and submit SAP to MDEQ for review and approval.
- Contact selected property owners that have MDEQ-approved sampling locations and schedule at time for collecting samples.
- Collect samples and submit to laboratory for analysis and complete data validation.
- Complete Interim Action Decision Matrix and determine if any mitigation measures are necessary.
- Schedule a meeting with property owners and review sampling results and proposed mitigation measures, if any.
- If appropriate, work out details for any mitigation measures and schedule implementation.
- Implement mitigation measures.
- Document results of IRA activities in a technical memorandum to MDEQ.

A summary of the estimated schedule is contained as Attachment C.



Source Information:
Base mapping from State of Michigan Center for Geographic Information, Geographic Data Library
Sample locations provided by MDEQ.

Figure A-1
Corning Lane IRA Area
Midland Soils Interim Response Activity Work Plan
Dow Midland Offsite Corrective Action Program

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Attachment 1 - Activity Survey

Activity Survey - Page 1 of 2

Surveyor Information

Date: _____ Completed by: _____

Phone: _____ e-mail: _____

Residence Information

Name: _____ Phone number: _____

Address: _____ e-mail: _____

City: _____

County: _____

Survey Questions

1. What type of structure is at the residence? **Mobile home** **Single story** **Multiple story**

2. Total number of residents (adults and children): _____

3. Approximate ages of residents:

Between:	Number
0-6 years	
7-12 years	
13-18 years	
19-35 years	
36-55 years	
56-75 years	
>75 years	

5. Are there outdoor play or recreational areas at this residence? **yes** **no**

6. Is there a basement at the residence? **yes** **no**

7. Do any household members engage in gardening? **yes** **no**

8. Do household members perform landscaping at the residence? **yes** **no**

9. Do any household members raised livestock at the residence? **yes** **no**

10. Are construction, renovation or landscaping projects planned in the near future at the residence? **yes** **no**

Please use the back of this form for any comments

Residence Information Form - Page 2 of 2

Date: _____

Residence Information

Name: _____

Address: _____

COMMENTS

Attachment 2 - Sample Access Agreement Language

Sample #1

AGREEMENT FOR ENVIRONMENTAL SAMPLING ACCESS

Site Address: _____

_____

_____

_____

As owner of the above-referenced property, _____ hereby grants (consultant), its contractor(s), agents, employees the right to enter the referenced property on behalf of The Dow Chemical Company (Dow), for the purpose of performing environmental sampling activities at the approximate location(s) identified on the attached diagram. (Consultant) or its contractor(s) shall consult and reach an agreement with the property owner prior to completing the sampling activities at the identified locations or at alternate or additional locations.

Soil borings will be completed and abandoned in accordance with applicable State of Michigan legal requirements.

Analytical results from the laboratory analysis of the sampling shall be provided to the property owner at the same time as the results are provided to the MDEQ.

By: _____ _____
Date

Title: _____

Property Owner

By: _____ _____
Date

Title: _____

Sample #2

Property Owner

Re: Site Access Agreement
(Address of Property Subject to Agreement)

Dear Property Owner:

We represent The Dow Chemical Company (Dow) in matters related to its investigation of the (study area). We understand that you own property at (address), which is (adjacent to/within study area). Dow has asked us to write to you concerning its work at the property, and to request your permission for access to your property to (description of work – e.g., collect x soil samples at the approximate locations shown on the attached map). This agreement is intended to supersede any prior access agreement between you and Dow, or its consultant, concerning your property.

Dow will provide you with the analytical results provided to the State of Michigan from sampling at your property. Reasonable measures will be taken to avoid damage to the property and/or interference with the present use of the property. [Dow will indemnify and hold you harmless from and against any loss, costs, damage or expense arising out of Dow's work on the property, except to the extent that you, or conditions existing at your property, may be at fault.] Upon completion of work with respect to the (study area), Dow will remove all equipment and restore the property to its condition prior to commencement to the work.

If you agree to grant Dow's request for access, please sign at the space provided at the end of this letter and return this letter to me. Your signature at the end of this letter will serve to grant Dow (including its employees, agents and consultants), permission to enter onto your property and perform the work described above. You may revoke this permission at any time by giving Dow at least sixty (60) days written notice of your intent to revoke.

If you have any questions about the terms of this letter, or would like further information about Dow's work, please do not hesitate to call me at the above letterhead address or at [ ].

Very truly yours,

Dow Representative

I have read the preceding letter and hereby grant Dow permission to enter onto my property under the terms described above.

Dated: _____ _____
(Name of Property Owner)

Sample #3

ACCESS AGREEMENT

This Access Agreement is made and entered into this _____ day of _____, ____ by and between (property owner) ("Grantor") and (The Dow Chemical Company) ("Grantee") pertaining to property located at _____ (the "Subject Property"), as follows:

A. Grantor is the current owner of the Subject Property. Grantee wishes to conduct environmental studies (the "Work") on the Subject Property.

B. Grantor wishes to provide to Grantee temporary ingress and egress on and over the Subject property for the limited purposes of conducting the environmental studies.

NOW, THEREFORE, in consideration of the foregoing and other good and valuable consideration, Grantor for itself, and its successors and assigns agrees with Grantee as follows:

Subject to the conditions and limitations listed below, Grantor hereby grant to Grantee, and Grantee's agents, environmental consultants, employees, contractors and sub-contractors, the right to enter onto the Subject Property for the purposes of completing the Work:

1. Grantee shall assume full responsibility for the proper abandonment of the Work and its components, in accordance with any applicable federal, state and local laws, rules, regulations and ordinances, wand shall remove all equipment used in the Work as soon as possible after the Work is completed.

2. Analytical results from laboratory sampling from the Work on the Subject Property shall be provided to Grantor when the results are reported to the Michigan Department of Environmental Quality.

3. Grantee will provide Grantor with copies of all reports prepared regarding the Work, upon request.

4. Grantee, and its agents, consultants, employees and contractors, agree to comply with all applicable laws, regulations, rules and permits, including, but not limited to environmental, OSHA and other health and safety matters, while performing the Work on the Subject Property.

5. Grantee shall indemnify, defend and hold harmless Grantor from and against any and all suits, claims, actions, administrative proceedings, damages, losses, costs (including costs of defense, settlement and reasonable attorneys fees), which are based upon or arise out of the acts or omissions of Grantee or its' agents, employees, consultants and contractors in performing the Work.

6. Upon completion of the Work, Grantee agrees to restore the Subject Property to the same condition or better than it was prior to engaging in the

Work, repairing or replacing any and all damages to the property within thirty (30) days of the date upon which Grantee has ceased Work upon the Subject Property.

7. This Agreement may be terminated by Grantor for Grantee's failure to comply with the terms and conditions contained in this Agreement upon written notification to Grantee. Otherwise, this Access Agreement, except the indemnification provisions of Paragraph 5, shall terminate upon completion of the Work being conducted by Grantee, the removal of all equipment used in the Work pursuant to Paragraph 1, the provision of analytical results and reports pursuant to Paragraphs 2 and 3, and the restoration of the Subject Property pursuant to Paragraph 6 of this Agreement.

IN WITNESS HEREOF, this Agreement has been executed the day and year first above written.

by Grantor:

_____

By Grantees:

_____

Sample # 4

CONSENT FOR ACCESS TO PROPERTY

Owner:

Description of Property:

The undersigned, _____, hereby consents to officers, employees and authorized representatives of The Dow Chemical Company, entering and having continued access to the above-referenced property for a period of thirty-six (36) months, beginning on the date hereof, for the following purposes:

(i) inspecting, sketching and photographing the premises;

(ii) collecting surface and subsurface soil samples;

(iii) collecting sediment samples;

(iv) conducting other environmental or ecological monitoring;

(v) transportation of equipment onto and about the Site as necessary to accomplish the activities above, including trucks and sampling equipment;

(vii) the placement of [e.g. animal traps, clay pads] on the Site as necessary; and

(viii) any other actions required pursuant to the (license issued to Dow by MDEQ (the "License")).

Dow representatives granted access for the above-listed purposes shall use reasonable efforts to minimize interference with, or interruption of, Owner's use of the premises. To the greatest extent achievable, said access to Owner's premises will be limited to ordinary business hours of 8:00 a.m. to 5:00 p.m. Monday through Friday.

Dow representatives granted access for the above-listed purposes shall sign-in on their arrival at the Owner's facility, noting, name, date, time, organization, and the purpose of the access or visit. Owner shall maintain a sign-in log for this purpose.

Owner expressly disclaims liability to all Dow representatives for any and all personal injury or property damage occurring on or about the Owner's premises not caused by Owner's negligence or willful misconduct.

We realize that these actions are undertaken by Dow pursuant to (the License).

This written permission is given by the undersigned voluntarily with knowledge of the undersigned's right to refuse and without threats or promises of any kind. The undersigned does not admit any liability with respect to the property by the undersigned's act of granting access to Dow.

This ____ day of _____, ____.

By: _____ Witness: _____

Its: _____

Appendix B
Work Plan for Areas Proximal to Facility

Midland Interim Response Activity

Work Plan for Areas Proximal to Facility

Prepared for

The Dow Chemical Company

47 Building
Midland, Michigan 48667

February 2004

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Contents

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Figures

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Work Plan for Areas Proximal to Facility

1. Objectives

The primary objective of this IRA is to collect additional site characterization data in order to evaluate concentrations of dioxins and furans in soils in areas that are near the northern and eastern boundaries of Dow's Michigan Operations Midland Plant (Facility). Four areas have been identified by MDEQ and this task includes 3 of the 4 areas. The remaining area is covered by the IRA entitled "Corning Lane".

2. Description of IRA Approach

2.1 Description of IRA Areas

MDEQ has collected soil samples at various locations in the City of Midland some which are in or adjacent to the 3 areas of concern identified under this IRA. The residential areas identified under this IRA include the following:

- North of Facility: This area consists of mixed residential and commercial/industrial land use bounded by Lyon Street on the north and west, homes on Tibbs Street to the east, and an abandoned railroad to the south. This area is shown in Figure B-1.
- East of Facility: This area consists predominantly of residential land use bounded Bay City Road to the north, Bierlein Properties to the west, Mark Putnam Road to the south, and Sam Street to the east. This area is shown in Figure B-2.
- Virginia Park Area: This area consists predominately of residential land use bounded by Eastlawn Drive to the north, Washington Street and Saginaw Road to the west, Patrick Road to the south, and Swede Road to the east. This area is shown in Figure B-3.

The MDEQ has indicated that collecting samples representative of properties in these areas is a high priority. This IRA work plan is designed to address these concerns in an expedited manner by collecting representative soil samples and analyzing them for dioxins and furans.

2.2 Objectives for Soil Sample Collection

The primary objective of soil sampling is to obtain data representative of concentrations of dioxin and furan concentrations in surface soils resulting from the historic deposition of chemicals emitted to the air from the Dow's Michigan Operations Midland facility in the areas previously identified. Another important objective for soil sampling will be to determine whether dioxin and furans are present in surface soils at concentrations greater than the IRA Action Levels. In addition, the following secondary objectives will also be considered:

- Collect data to necessary for developing site-specific cleanup criteria for soils in Midland.
- Collect information regarding the presence of concentrations of constituents of potential concern (other than dioxins and furans) in surface soils.

- Collect data on the variability of concentrations in soil that can be used to develop the sampling design for the remedial investigation.
- Provide a data set on constituents detected in soil in the areas of interest that can be used for comparison with concentrations in soil in background areas. This comparison will be used to better differentiate those chemicals that are facility-related, from chemicals that are part of the natural or anthropogenic background. Identification of background sampling locations is not proposed at this time, but will be part of the upcoming Remedial Investigation.

2.3 Summary of Sampling and Analytical Plan

Site-specific sampling and analytical plan (SAP) will be prepared once access agreements have been secured. The SAP will provide the site-specific details associated with field sampling efforts, and will include:

- Sampling event objective
- Data Quality Objective(s)
- Description of sampling effort
- Sampling Locations (figure with locations shown on a GIS aerial photo base map)
- Sample Details (a matrix indicating media, sampling interval, and analytes)
- Analyte lists which may include the PCOIs identified to date as part of the development of the Current Conditions Report

The SAP will be provided to MDEQ for review and approval prior to beginning sampling activities. The following sections summarize the general approach that will be included in the SAP for the Areas Proximal to the Facilty.

2.3.1 Sampling Locations

Approximately 10 sample locations will be selected from each of the 3 areas identified as part of this IRA, depending upon the availability of sampling sites. Sampling locations will be selected to be representative of concentrations in each area. Actual locations proposed for sampling will be dependent upon Dow's ability to obtain access from property owners. The priority for sampling locations will be on City of Midland owned parks and other properties.

Upon approval of this IRA work plan, Dow will meet with MDEQ to discuss potential sampling locations and will formally request access for the purpose of collecting soil samples from the City. In the event that the City denies access, Dow will meet with MDEQ to discuss alternative sampling locations and will initiate contact with other landowners.

2.3.2 Target Analyte List

The target analyte list proposed for this sampling event will consist of the following categories of analytes:

- Dioxins and furans (analytical method SW846 8290)
- Volatile organic compounds (VOCs; analytical method SW846 5035/8260B)
- Semivolatile organic compounds (SVOCs; analytical method SW846 8270C)
- Metals (analytical methods SW846 6010B, 7000 series methods ,9010B/9012A)

Herbicides and pesticides are not proposed for analysis. It is unlikely that these constituents would become deposited onto the soil from the Facility due to airborne deposition. Also, uses of these chemicals for residential and industrial pest control, and other anthropogenic background sources, could produce concentrations of these chemicals in soil that are unrelated to deposition from Facility operations.

The full analyte list and laboratory analytical procedure for each of class of compounds listed above is contained in the Quality Assurance Project Plan (QAPP). The QAPP will be submitted to MDEQ for approval as a separate document. In general, the analyte lists are derived from Appendix IX of 40 CFR Part 264 and MDEQ target analyte lists. Analytical methods and detection limits will conform to USEPA SW846 and MDEQ Operational Memorandum #6.

2.3.3 Soil Sampling Procedures

Soil sampling procedures will be accordance with the protocols contained the in the QAPP and associated Standard Operating Procedures (SOPs).

2.3.4 Reporting

Dow will prepare a brief technical memorandum documenting the results of the soil sampling, completed Activity Surveys, and any mitigation measures completed.

3. Access Needs and Agreements

Example survey forms are provided in Attachment 1 of this IRA Work Plan.

A sample access agreement is included as Attachment 2. The form of the access agreement will depend upon the type of access needed and the work to be performed. The final form of the access agreement will depend upon negotiations between Dow and the property owner/resident.

4. Schedule

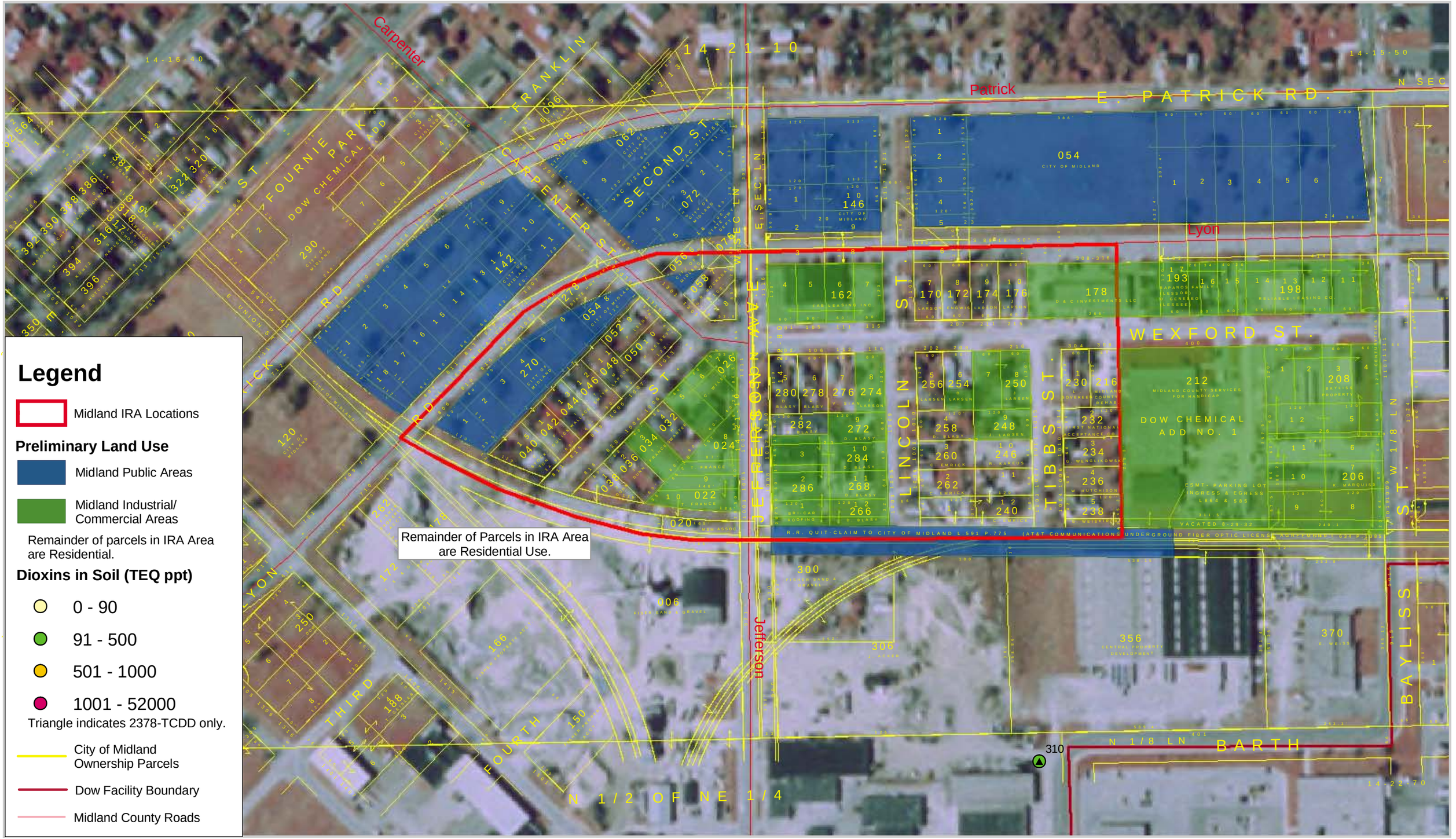
The general schedule for implementation of s work plan is as follows:

- Within 2 weeks of approval of this work plan: Contact City of Midland and request a meeting to provide an access agreement and review the purpose of this IRA.

Dow will work to complete the remaining work in an expedited manner and will provide MDEQ with a bi-monthly update on progress of the IRA. Because Dow cannot control the schedule for the many of the necessary steps, the following steps are generally outlined to show the process for implementation of this IRA:

- Obtain executed access agreement and visit field sites to verify potential sampling locations, as soon as weather permits.
- Prepare SAP and submit to MDEQ for review and approval.
- Collect samples and submit samples to laboratory for analysis and complete data validation.
- Document results of IRA activities in a technical memorandum to MDEQ.

A summary of the estimate schedule is contained in Attachment C.



N W E S

0 75 150 300 Feet

Source Information:
Base mapping from State of Michigan Center for Geographic Information, Geographic Data Library.
Existing sample locations provided by MDEQ.

Figure B-1
North of Facility IRA Area
Midland Soils Interim Response Activity Work Plan
Dow Midland Offsite Corrective Action Program

Source Information:
Base mapping from State of Michigan Center for Geographic Information, Geographic Data Library.
Existing sample locations provided by MDEQ.

Figure B-2
East of Facility IRA Area
Midland Soils Interim Response Activity Work Plan
Dow Midland Offsite Corrective Action Program

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File Path: CGREER C:\GIS\MapDocs\Project IRAs\Dow-IRAs EastofFacility noowner LandUse FigB-2.mxd, Date: 02 16, 2004 11:48 PM

Legend

Midland IRA Locations

Preliminary Land Use

Midland Public Areas

Midland Industrial/ Commercial Areas

Remainder of parcels in IRA Area are Residential.

Dioxins in Soil (TEQ ppt)

- 0 - 90
- 91 - 500
- 501 - 1000
- 1001 - 52000

Triangle indicates 2378-TCDD only.

City of Midland Ownership Parcels

Midland County Roads

N W E S

0 150 300 600 Feet

Source Information:
Base mapping from State of Michigan Center for Geographic Information, Geographic Data Library.
Existing sample locations provided by MDEQ.

Figure B-3
Virginia Park IRA Area
Midland Soils Interim Response Activity Work Plan
Dow Midland Offsite Corrective Action Program

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Attachment 1 - Activity Survey

Activity Survey - Page 1 of 2

Surveyor Information

Date: _____ Completed by: _____

Phone: _____ e-mail: _____

Residence Information

Name: _____ Phone number: _____

Address: _____ e-mail: _____

City: _____

County: _____

Survey Questions

1. What type of structure is at the residence? **Mobile home** **Single story** **Multiple story**

2. Total number of residents (adults and children): _____

3. Approximate ages of residents:

Between:	Number
0-6 years	
7-12 years	
13-18 years	
19-35 years	
36-55 years	
56-75 years	
>75 years	

5. Are there outdoor play or recreational areas at this residence? **yes** **no**

6. Is there a basement at the residence? **yes** **no**

7. Do any household members engage in gardening? **yes** **no**

8. Do household members perform landscaping at the residence? **yes** **no**

9. Do any household members raised livestock at the residence? **yes** **no**

10. Are construction, renovation or landscaping projects planned in the near future at the residence? **yes** **no**

Please use the back of this form for any comments

Residence Information Form - Page 2 of 2

Date: _____

Residence Information

Name: _____

Address: _____

COMMENTS

Attachment 2 - Sample Access Agreement Language

Sample #1

AGREEMENT FOR ENVIRONMENTAL SAMPLING ACCESS

Site Address: _____

_____

_____

_____

As owner of the above-referenced property, _____ hereby grants (consultant), its contractor(s), agents, employees the right to enter the referenced property on behalf of The Dow Chemical Company (Dow), for the purpose of performing environmental sampling activities at the approximate location(s) identified on the attached diagram. (Consultant) or its contractor(s) shall consult and reach an agreement with the property owner prior to completing the sampling activities at the identified locations or at alternate or additional locations.

Soil borings will be completed and abandoned in accordance with applicable State of Michigan legal requirements.

Analytical results from the laboratory analysis of the sampling shall be provided to the property owner at the same time as the results are provided to the MDEQ.

By: _____ _____
Date

Title: _____

Property Owner

By: _____ _____
Date

Title: _____

Sample #2

Property Owner

Re: Site Access Agreement
(Address of Property Subject to Agreement)

Dear Property Owner:

We represent The Dow Chemical Company (Dow) in matters related to its investigation of the (study area). We understand that you own property at (address), which is (adjacent to/within study area). Dow has asked us to write to you concerning its work at the property, and to request your permission for access to your property to (description of work – e.g., collect x soil samples at the approximate locations shown on the attached map). This agreement is intended to supersede any prior access agreement between you and Dow, or its consultant, concerning your property.

Dow will provide you with the analytical results provided to the State of Michigan from sampling at your property. Reasonable measures will be taken to avoid damage to the property and/or interference with the present use of the property. [Dow will indemnify and hold you harmless from and against any loss, costs, damage or expense arising out of Dow's work on the property, except to the extent that you, or conditions existing at your property, may be at fault.] Upon completion of work with respect to the (study area), Dow will remove all equipment and restore the property to its condition prior to commencement to the work.

If you agree to grant Dow's request for access, please sign at the space provided at the end of this letter and return this letter to me. Your signature at the end of this letter will serve to grant Dow (including its employees, agents and consultants), permission to enter onto your property and perform the work described above. You may revoke this permission at any time by giving Dow at least sixty (60) days written notice of your intent to revoke.

If you have any questions about the terms of this letter, or would like further information about Dow's work, please do not hesitate to call me at the above letterhead address or at [ ].

Very truly yours,

Dow Representative

I have read the preceding letter and hereby grant Dow permission to enter onto my property under the terms described above.

Dated: _____ _____
(Name of Property Owner)

Sample #3

ACCESS AGREEMENT

This Access Agreement is made and entered into this _____ day of _____, ____ by and between (property owner) ("Grantor") and (The Dow Chemical Company) ("Grantee") pertaining to property located at _____ (the "Subject Property"), as follows:

A. Grantor is the current owner of the Subject Property. Grantee wishes to conduct environmental studies (the "Work") on the Subject Property.

B. Grantor wishes to provide to Grantee temporary ingress and egress on and over the Subject property for the limited purposes of conducting the environmental studies.

NOW, THEREFORE, in consideration of the foregoing and other good and valuable consideration, Grantor for itself, and its successors and assigns agrees with Grantee as follows:

Subject to the conditions and limitations listed below, Grantor hereby grant to Grantee, and Grantee's agents, environmental consultants, employees, contractors and sub-contractors, the right to enter onto the Subject Property for the purposes of completing the Work:

1. Grantee shall assume full responsibility for the proper abandonment of the Work and its components, in accordance with any applicable federal, state and local

laws, rules, regulations and ordinances, wand shall remove all equipment used in the Work as soon as possible after the Work is completed.

2. Analytical results from laboratory sampling from the Work on the Subject Property shall be provided to Grantor when the results are reported to the Michigan Department of Environmental Quality.

3. Grantee will provide Grantor with copies of all reports prepared regarding the Work, upon request.

4. Grantee, and its agents, consultants, employees and contractors, agree to comply with all applicable laws, regulations, rules and permits, including, but not limited to environmental, OSHA and other health and safety matters, while performing the Work on the Subject Property.

5. Grantee shall indemnify, defend and hold harmless Grantor from and against any and all suits, claims, actions, administrative proceedings, damages, losses, costs (including costs of defense, settlement and reasonable attorneys fees), which are based upon or arise out of the acts or omissions of Grantee or its' agents, employees, consultants and contractors in performing the Work.

6. Upon completion of the Work, Grantee agrees to restore the Subject Property to the same condition or better than it was prior to engaging in the Work, repairing or replacing any and all damages to the property within thirty (30) days of the date upon which Grantee has ceased Work upon the Subject Property.

7. This Agreement may be terminated by Grantor for Grantee's failure to comply with the terms and conditions contained in this Agreement upon written notification to Grantee. Otherwise, this Access Agreement, except the indemnification provisions of Paragraph 5, shall terminate upon completion of the Work being conducted by Grantee, the removal of all equipment used in the Work pursuant to Paragraph 1, the provision of analytical results and reports pursuant to Paragraphs 2 and 3, and the restoration of the Subject Property pursuant to Paragraph 6 of this Agreement.

IN WITNESS HEREOF, this Agreement has been executed the day and year first above written.

by Grantor:

_____

By Grantees:

_____

Sample # 4

CONSENT FOR ACCESS TO PROPERTY

Owner:

Description of Property:

The undersigned, _____, hereby consents to officers, employees and authorized representatives of The Dow Chemical Company, entering and having continued access to the above-referenced property for a period of thirty-six (36) months, beginning on the date hereof, for the following purposes:

(i) inspecting, sketching and photographing the premises;

(ii) collecting surface and subsurface soil samples;

(iii) collecting sediment samples;

(iv) conducting other environmental or ecological monitoring;

(v) transportation of equipment onto and about the Site as necessary to accomplish the activities above, including trucks and sampling equipment;

(vii) the placement of [e.g. animal traps, clay pads] on the Site as necessary; and

(viii) any other actions required pursuant to the (license issued to Dow by MDEQ (the "License")).

Dow representatives granted access for the above-listed purposes shall use reasonable efforts to minimize interference with, or interruption of, Owner's use of the premises. To the greatest extent achievable, said access to Owner's premises will be limited to ordinary business hours of 8:00 a.m. to 5:00 p.m. Monday through Friday.

Dow representatives granted access for the above-listed purposes shall sign-in on their arrival at the Owner's facility, noting, name, date, time, organization, and the purpose of the access or visit. Owner shall maintain a sign-in log for this purpose.

Owner expressly disclaims liability to all Dow representatives for any and all personal injury or property damage occurring on or about the Owner's premises not caused by Owner's negligence or willful misconduct.

We realize that these actions are undertaken by Dow pursuant to (the License).

This written permission is given by the undersigned voluntarily with knowledge of the undersigned's right to refuse and without threats or promises of any kind. The undersigned does not admit any liability with respect to the property by the undersigned's act of granting access to Dow.

This ____ day of _____, ____.

By: _____ Witness: _____

Its: _____